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J. Douglas
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(N.E.)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **ATTN: BOX RCE**
Choong Seng BOON : **Confirmation No. 8585**
Serial No. 09/155, 398 : **Docket No.01489/P158730**
Filed February 2, 1999 : **Group Art Unit 2613**
 : **Examiner Y. Lee**

DIGITAL IMAGE REPLENISHMENT
METHOD, IMAGE PROCESSING DEVICE
AND DATA RECORDING MEDIUM

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RESPONSE

Assistant Commissioner for Patents,
Washington, D.C.

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975

Sir:

In response to the Office Action of September 5, 2002, the period for response having been extended for three months by the attached petition and the concurrent filing of an RCE, reconsideration is respectfully requested in view of the following remarks.

The Applicant notes that claims 35-38 are currently pending in this application.

It is noted that the Examiner has rejected claims 35-38 under 35 U.S.C. § 103(a) as being unpatentable over Murakami et al. (USPN:5,274,442) in view of Lee (USPN: 5,990,956) for the reasons contained in paragraph 3 on pages 2-4 of the Office Action.

The Applicant respectfully traverses the Examiner's aforementioned rejection and submits that the present invention, as claimed in each of independent claims 35-38, clearly patentably distinguishes over the Murakami et al. and Lee references relied upon by the Examiner for at least the following reasons.

The present invention provides an image coding/decoding method, and a computer readable data recording medium containing program code operable to make a computer perform the image coding/decoding method, in which motion compensation prediction coding is performed to a digital

image signal, the method comprising performing a padding process to a prediction image signal that is generated by a motion compensation process performed to the digital image signal, wherein the padding process performed to the prediction image signal comprises a padding process performed to a first small image space comprising pixels on odd number pixel rows in the original image space and a padding process performed to a second small image space comprising pixels on even numbered pixel rows in the original image space. As a result of the foregoing features, prediction errors can be reduced by carrying out the padding process since high frequency components are suppressed from being introduced into the images having strong intra-field value correlation accompanying the padding process.

More specifically, it is noted that the present invention provides an image coding/decoding method, and a computer readable data recording medium containing program code operable to make a computer perform the image coding/decoding method, comprising: a padding process comprising dividing a predictive image space formed by the predictive image signal into a first small image space comprising only pixels on odd-numbered pixel rows in the predictive image space and a second small image space comprising only pixels on even-numbered pixel rows in the predictive image space; generating first padding pixel values from values of significant pixels in the first small image space and replacing values of insignificant pixels in the first small image space with the first padding pixel values; and generating second padding pixel values from values of significant pixels in the second small image space and replacing values of insignificant pixels in the second small image space with the second padding pixel values, as particularly recited in each of independent claims 35-38.

Thus, the present invention performs padding for the prediction image signals employed in the motion compensation prediction coding separately for odds fields and for even fields. Thus, the present invention can reduce the prediction errors when performing prediction coding of video signals having strong intra-field value correlation while suppressing the introduction of high frequency components accompanying the padding process.

It is strongly submitted that the above discussed features of the present invention are encompassed within the limitations of independent claims 35-38 of the present application. Further,

it is submitted that the above limitations, and the above advantages resultant therefrom, are not disclosed or suggested by the Lee and Murakami et al. references.

It is noted that the Examiner has asserted, on page 3 of the Office Action, that, "***It is noted Murakami et al differs from the present invention in that it fails to disclose any padding process as specified in claims 35-38. Lee however, in Figure 2, teaches the concept of such well know padding process (i.e., substitute pixels) in which values of insignificant pixels (i.e., background) are replaced with padding pixels values generated on a basis of the significant pixel values (i.e., object)...***" [emphasis added]. Moreover, in response to the Applicant's previously filed remarks, the Examiner states in paragraph 4 on page 4 of the Office Action, that "***Regarding applicant's argument that neither Murakami et al nor Lee discloses the means to divide the multiplicity of image blocks into smaller image spaces, it was clearly stated in the previous office action that Murakami et al. discloses all these means in Figure 6. It is true that Lee does not disclose any pre-padding processing of the signal as that claimed by the Applicant. However, examiner does not rely on Lee to teach such capabilities because they are already disclosed in Murakami et al.***"

From the foregoing statements made by the Examiner, the Applicant believes that the Examiner has failed to appreciate and understand that the feature of "dividing a predictive image space formed by the predictive image signal into a first small image space comprising only pixels on odd-numbered pixel rows in the predictive image space and a second small image space comprising only pixels on even-numbered pixel rows in the predictive image space", as recited in each of independent claims 35-38 is part of the padding process.

Thus, the Examiner's statements that the Murakami et al. reference fails to disclose any padding process and that it is true that Lee does not disclose any pre-padding processing (Examiner is referring to the dividing of the image space), this leads to the fact that neither the Lee nor Murakami et al. reference discloses or suggests the aforementioned features of "a padding process comprising dividing a predictive image space formed by the predictive image signal into a first small image space comprising only pixels on odd-numbered pixel rows in the predictive image space and a second small image space comprising only pixels on even-numbered pixel rows in the predictive image space" as particularly recited in each of independent claims 35-38.

The Applicant would like to strongly emphasize that the present invention provides a feature of **padding** wherein a predictive image space (for example, 8x8 pixels as shown in Figure 2) formed by the predictive image signal is **divided into a first small image space (for example, 4x4 pixels) comprising only pixels on odd-numbered pixels rows in the predictive image space and a second small image space (for example, 4x4 pixels) comprising only pixels on even-numbered pixels rows** in the predictive image space **before** generating first and second padding pixel values for the first and second small images spaces, respectively. Thus, the present invention is able to prevent high frequency components of image signals forming the original image space from increasing due to a padding process of the image space by performing the padding process to the smaller image spaces which have higher pixel value correlation than that of the original image space.

It is strongly submitted that the above discussed features of the present invention are encompassed within the limitations of newly added independent claims 35-38 of the present application. Further, it is submitted that the above limitations, and the above advantages resultant therefrom, are not disclosed or suggested by the Lee and Murakami et al. references taken either alone or in combination.

Regarding the Lee patent (USPN: 5,990,956), the Applicant notes that this reference discloses a method and apparatus for padding a video signal for use in a video encoder employing a shape adaptive discrete cosine transform technique. However, unlike the present invention as claimed in independent claims 35-38, it is noted that the Lee system does not disclose or suggest dividing the multiplicity of image blocks into smaller image spaces (as admitted by the Examiner).

Regarding the Murakami et al. reference, the Applicant notes that this reference merely discloses a coding system for adaptively discriminating between a block which is effective for non-interleave blocking and a block which is effective for individual field blocking. Not only does this reference fail to disclose or suggest a padding process comprising a dividing of an image space into smaller images spaces as claimed in independent claims 35-38, this reference fails to even disclose or suggest a padding process (as admitted by the Examiner).

Accordingly, the Applicant strongly submits that the Lee and Murakami references fail to disclose, suggest, or render obvious a padding process which comprises: dividing a predictive image

space formed by the predictive image signal into a first small image space comprising only pixels on odd-numbered pixel rows in the predictive image space and a second small image space comprising only pixels on even-numbered pixel rows in the predictive image space; generating first padding pixel values from values of significant pixels in the first small image space and replacing values of insignificant pixels in the first small image space with the first padding pixel values; and generating second padding pixels values from values of significant pixels in the second small image space and replacing values of insignificant pixels in the second small image space with the second padding pixel values, as particularly recited in each of independent claims 35-38.

For the foregoing reasons, it is submitted that each of independent claims 35-38 clearly is allowable.

In view of the foregoing, it is submitted that the present application now in fact clearly is in condition for allowance and the Examiner therefore is requested to pass this case to issue.

In the event, however that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any such matters.

Respectfully submitted,

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March 5, 2003